SR 10
Recorder
User's Manual

IM 4D8B2-01E

IM 4D8B2-01E
2nd Editionn

Notes

- The contents of this manual are subject to change without prior notice as a result of improvements in the instrument's performance and functions. Display contents illustrated in this manual may differ slightly from what actually appears on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your sales representative.

Disk No. MR32
2nd Edition : May 1999 (YG)
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SAFETY PRECAUTIONS

This recorder is developed to satisfy and to be used under the following conditions:

- It is a component type instrument to be installed on an instrumentation panel or rack.
- It complies with the IEC class II safety standard.
- It complies with the EN61010-1 safety standard.
- It complies with the CSA1010-1 safety standard.
- It is based on EN55011 (EMI) Group 1, Class A (for commercial and industrial use).
- It complies with the EN50082-2 (EMS) safety standard.

General definitions of safety symbols used on the recorder and in this manual:

Make sure to comply with the following safety precautions. Not complying might result in injury, death of personnel, or cause damage to the instrument. We assume no liability for customer's failure to comply with these requirements.

Where this mark is found on the recorder there is danger of injury or death.
Please check the manual carefully

Power ON

Power OFF

Equipment protected throughout by double insulation or reinforced insulation (Class II).

In-position of bistable push control

Out-position of bistable push control

Alternating current

Functional earth terminal (This terminal should not be used as a "Protective earth terminal".)

WARNING

Power Supply
Ensure the source voltage matches the voltage of the power supply before turning ON the power.

Grounding
Make sure to ground the recorder before turning on the power.

Necessity of Grounding
Grounding is necessary to prevent noise interference.

Do not Operate in an Explosive Atmosphere
Do not operate the recorder in the presence of flammable liquids or vapors. Operation of any electrical instrument in such an environment constitutes a safety hazard.

Keep Away from Live Circuits
Inside this recorder there are areas of high voltage; therefore, never touch the interior when the power supply is connected. The recorder has replacable parts and subassemblies; however, the replacement must be carried out only by our service personnel.

External Connection
Before connecting to measurement and control unit, connect the grounding wire.

Using the User's Manual

This manual contains information about the instrument's functions and operating procedures as well as precautions that should be observed during use. To ensure proper use of the instrument, please read this manual thoroughly before operating it. Keep the manual in a safe place for quick reference whenever a question arises.

Two manuals are provided with the instrument, including this User's Manual.

Manual Name	Manual No.	Description
User's Manual	IM 4D8B2-01E	Basic information for recorder operators.
Technical Manual	IM 4D8B2-04E	Detailed technical manual for recorder engineers, including mounting, wiring and setting information. Read this manual first.

Structure of this Manual

Chapter	Title	Content
1	**Before Operation**	Explains basic functions and display of the recorder, and contains the handling precautions. Please read carefully.
2	**Daily Operation**	Contains all information needed for simple daily operation of the recorder, including instructions on chart, pen and ribbon cassette replacement
3	**Maintenance**	About periodic inspection and clening of the recorder
4	**Troubleshooting**	Explains the meaning of some basic error messages on recorder display.
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Conventions Used in this Manual

Displayed characters

Bold alphanumeric characters enclosed with **[ ]** refer to characters or setting values that are displayed on the screen.

Symbols

The following symbol marks are used to attract the operator's attention.

Affixed to the instrument. Indicates danger to personnel or instrument and the operator must refer to the User's Manual. ThinUser's Manual to indicate the reference.

WARNING Describes precautions that should be observed to prevent injury or death to the user.

CAUTION Describes precautions that should be observed to prevent minor or moderate injury, or damage to the instrument.

Note Provides important information for the proper operation of the instrument.

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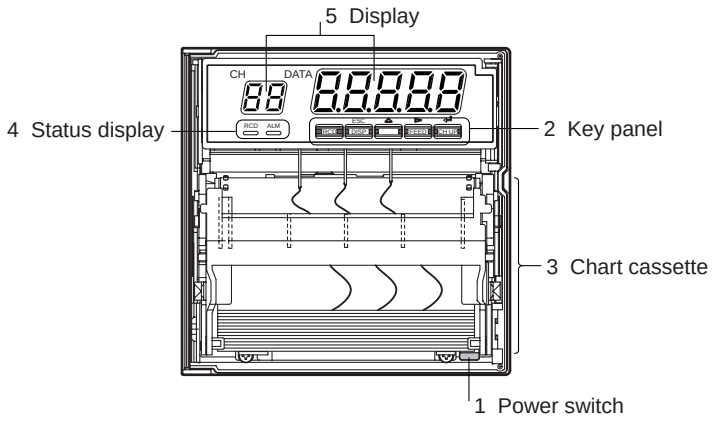
1.1 Front/Rear Panels: Functions and Display

Front Panel



1. **Power switch (push-button type)**
   Pressing the switch turns the power ON and OFF.

2. **Key panel (push-key type)**
   The panel contains the follwing five keys:

RCD

RCD key
Pressing the key starts or stops the recording.

ESC
DISP

DISP key, **ESC** key
DISP function: Cycles through the modes of display in the order of AUTO, MANUAL, and OFF. Also selects between the Regular Setting and Operation modes.
If this key is pressed for three seconds, the recorder enters the Regular Setting Mode.
ESC function: Exits from the menu in the middle of setting or selecting procedures.

△

△ key
Selects setting parameters (numerics or command codes). Selecting step is upward circulation.
If the recorder is a pen model, pressing this key for three seconds causes the recorder to enter the pen-replacement mode.

▷
FEED

FEED key, ▷ key
FEED function: The chart is fed as long as this key is being pressed.
▷ key function: Changes the number of digits for setting numeric values. The digit moves from high to low.

↵
CH UP

CH UP key, **ENT** key
CH UP function: Selects a channel for which the display shows the screen in the MANUAL display mode.
↵ function: Makes a parameter entry or executes a function after selecting parameters (numerals or command codes). Pressing the key executes the settings.

3. **Chart cassette**
   Contains a Z-fold chart (width: 100 mm, length: 16 m).

4. **Status Display**
   RCD indicator: illuminated when recording of measurement values is in progress.
   ALM indicator: illuminates when an alarm occurs.

5. **Seven-segment character display**
   Used to display data, setting screen, and so on.
   • Data display (left) : Displays channel No., type of alarms, and measured data.
   • Setting screen (right) : Displays various settings of the recorder.

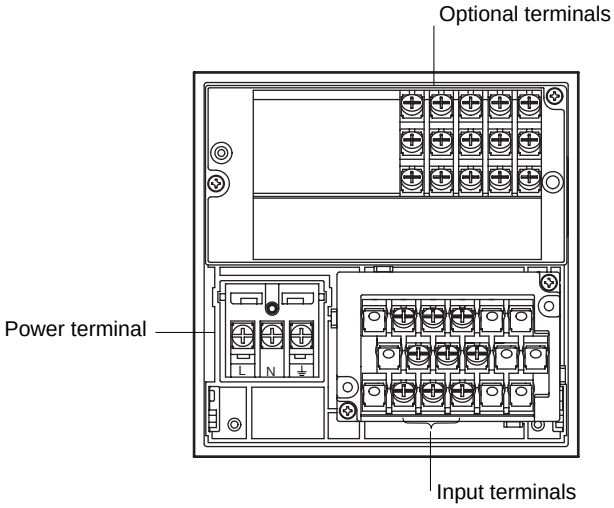
Characters on Display

The display consists of seven segments, and therefore characters exist which are difficult to display.
Characters are presented on the display as shown in the following table:

Display														
Alphabet	A	B	C	D	E	F	G	H	h	I	J	K	L	l
Display														
Alphabet	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Rear Panel

Below, the rear panel of the dot model recorder, for more details and the rear of the pen model recorder see the *Technical Manual,* Section 1.7, *Wiring*.



1.2 Handling Precautions

Safety precautions

- Before you use this recorder make sure to read the Safety Precautions on page 2 of this manual.
- Do not touch the interior of this recorder. For the replacement of parts, please contact the dealer of which you purchased this recorder
- Turn the recorder power switch off as soon as any symptoms of malfunction such as unusual sound, smell, or smoke yield from the recorder. Also turn the main power switch off.
  If a malfunction occurs, contact the dealer from which you purchased the instrument.

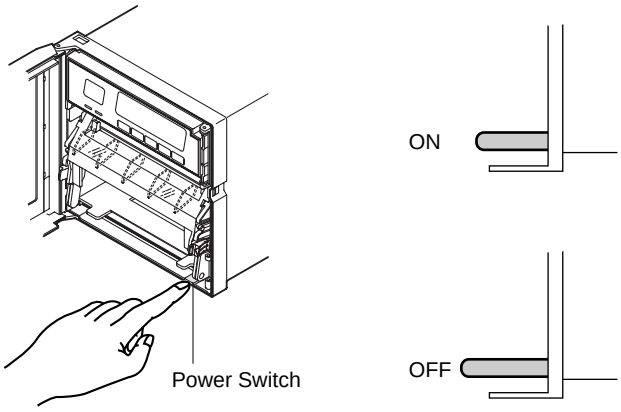
General handling precautions

- The recorder contains many plastic parts. To clean, use a soft, dry cloth. Do not use chemicals such as benzene or thinner, since these may cause discoloration or damage.
- Do not bring any objects charged with static electricity near the signal terminals. This might cause malfunction.
- Do not allow any volatile substances to the front or key panel. Do not allow rubber or vinyl to remain in contact with the recorder for long periods.
- Whenever the recorder is not used, turn the power switch OFF.

2.1 Recording

Switching Power ON/OFF

The power switch is located at the lower right-hand corner of the front face behind the door. The switch is a push-button type. Press the switch to turn the recorder ON and press again to turn it OFF.
After the power turns ON, the recorder executes a self-diagnostic check for several seconds before starting measurement and recording.



Note

- The warm-up time is approximately 30 minutes; however, after the initial start-up, the recorder might need more time.
- If the input wiring is connected parallel with other equipment, do not turn the power switch ON/OFF to prevent fluctuations in measuring values.

Starting/Stopping Recording

Press the **RCD** key to start or stop the recording.

Feeding Chart Paper

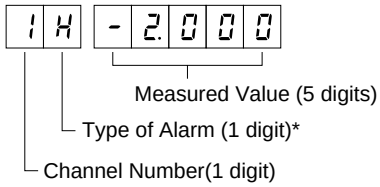
The chart paper is fed by pressing the **FEED** key as long as the key is pressed.
See also Section 2.4, *Loading Chart Paper*.

2.2 Selecting the Display

Three different displays can be selected: Auto, Manual, and dislay OFF.
If the **DISP** key is pressed you the recorder will change the display modes in the order of AUTO > MANUAL > OFF,
Note that manual display can't be selected on the 1-pen model.

Auto Display

Channel number and measured values will appear on the display.
Every channel will be shown for approximately 2 sec. If the input is greater than the upper limit of the recording span, – – – – will appear.
If the input is less than the lower limit of the recording span, – – – – – will appear.



*Type of alarm
H : high limit
L : low limit

Manual Display

Pen model

The measured values of specified channels are alternately displayed every two seconds.
The contents of the display are the same as that of auto mode.

Dot-printing model (Dot model)

The measured values of specified channels are alternately displayed every measurement cycle. The contents of the display are the same as that of auto mode.

Pressing the **CH UP** key changes the channel No. being displayed (channel No. increases).
Manual display can't be selected on the 1-pen model.

Display OFF

Turns OFF all displays except the status display.

Characters on Display

The display consists of seven segments, and therefore characters exist which are difficult to display.
Characters are presented on the display as shown in the following table:

Display	A	b	C	d	E	F	G	H	h	I	J	K	L	l
Alphabet	A	B	C	D	E	F	G	H	h	I	J	K	L	l
Display	n	n	o	P	q	r	S	t	U	V	W	X	Y	Z
Alphabet	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

2.3 Recorder Modes

The recorder has three modes as described below:

Operation Mode

This is the mode for daily operation; when the power turns on, the recorder automatically enters this mode.
Select from the following functions by pressing the appropriate keys on the key panel.

△ key	Replacement of pens (pen model only). See Section2.5.
RCD key	Starting/stopping the recording.
FEED key	Feeding the chart. See Section 2.1, *Feeding Chart Paper.*
DISP key	Selection from the modes on display. See Section1.1.

Regular Setting Mode

In this mode, daily-used data such as alarm setpoints, date, and time are set. Pressing the **DISP** key three seconds in the operation mode changes the mode to the Regular Setting mode. For details, refer to the *Technical Manual* Section 2, *Regular Settings*.

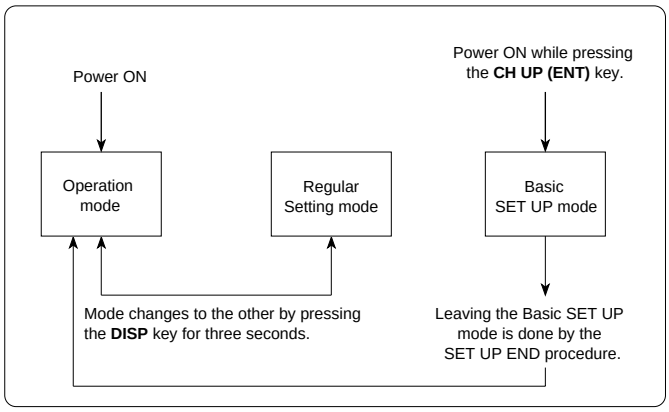
Basic (SETUP) Setting Mode

In the Basic (SETUP) Setting Mode, you can adjust a whole range of detailed settings such as the pen's position, dot printing postion and color, the noise input filter, and remote trigger settings. For details, refer to the *Technical Manual* Section 3.

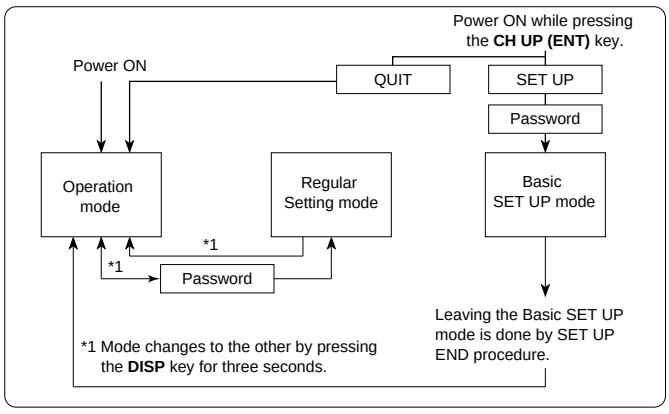
Note

- While in the Basic (SETUP) mode, measurement, recording, and alarm detection are not carried out.
- Using the settings protection function, you can protect your settings by defining a password when you enter the Regular or Basic (SETUP) mode. For details on the settings protection function, see the *Technical Manual* Section 3.12.

Turning the Recorder Modes ON


Power ON
Power ON while pressing the **CH UP (ENT)** key.
Operation mode
Regular Setting mode
Basic SET UP mode
Mode changes to the other by pressing the **DISP** key for three seconds.
Leaving the Basic SET UP mode is done by the SET UP END procedure.

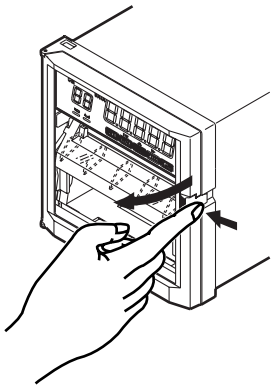
Turning the Recorder Modes OFF


Power ON while pressing the **CH UP (ENT)** key.
Power ON
QUIT
SET UP
Password
Operation mode
Regular Setting mode
Basic SET UP mode
*1
*1
Password
Leaving the Basic SET UP mode is done by SET UP END procedure.
*1 Mode changes to the other by pressing the **DISP** key for three seconds.

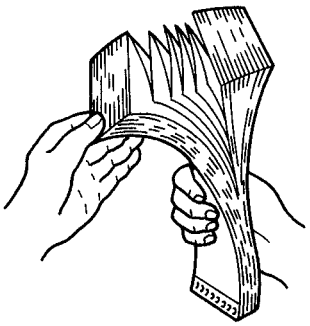
2.4 Loading Chart Paper

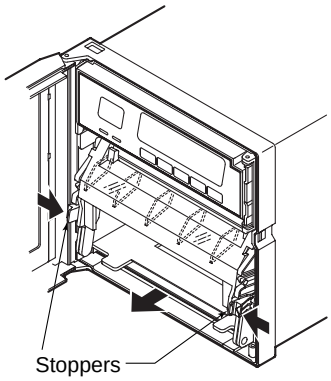
Installing/Replacing Chart Paper

1. Open the front door of the recorder, as shown below.

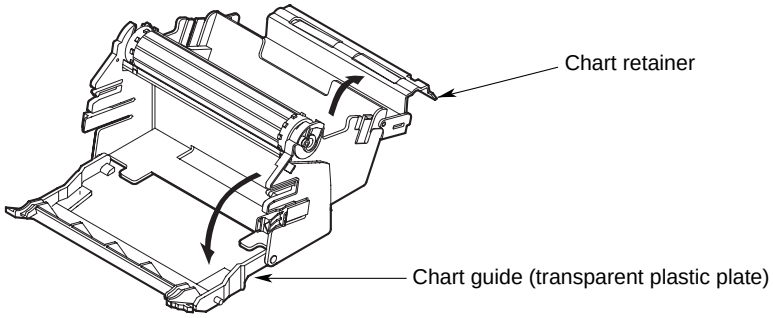


2. Make sure that recording is OFF. Power may be ON.
3. Riffle the chart thoroughly before loading.
4. While gently pressing the chart-cassette stoppers, located at both front ends of the cassette, lift and draw the cassette out of the recorder case.





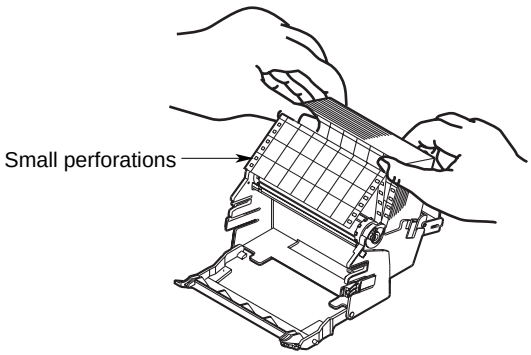
5. Open the chart retainer backward on the cassette.
6. Pull and open the front transparent chart guide.



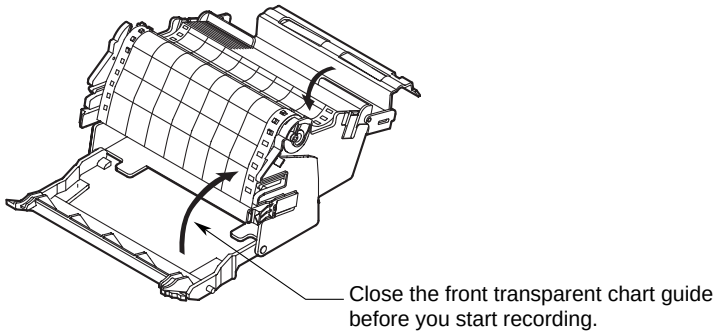
CAUTION

- If you replace the chart paper compartment back into the unit without closing the front transparent chart guide, the lock tabs might be damaged.

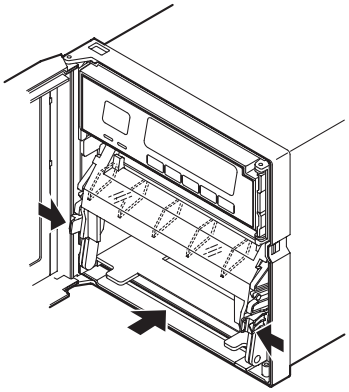
7. Load the chart paper into the chart compartment; the small perforations should be at the left-hand. Make sure that the sprocket teeth of the chart drives are properly engaged in the chart paper perforations. Take care not to load the chart paper backwards.



8. Close the chart retainer.
9. Close the chart guide (transparent plastic plate).



10. Replace the chart cassette back into the recorder case; hang the knurls of the cassette to the grooves of the case, and move the cassette to trap the stopper.



11. Press the **FEED** key on the key panel to assure that the chart moves two or more folds smoothly into the chart receiver. If it moves unsteadily, do the installing procedure again from step (4).

Note

A red band with a 'RENEW CHART' notice appears when the chart nears to its end (length of remaining chart is approximately 40 cm) to suggest you to prepare a new chart.

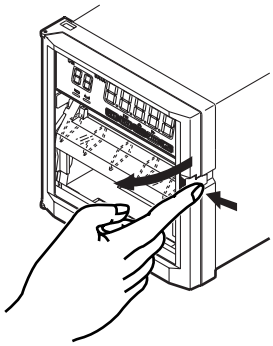
2.5 Installing/Replacing Pens (Pen Model)

CAUTION

- Do not press or pinch the felt tip to prevent deformation. Do not move the pen holder up- or down-scale to protect the driving mechanism.
- Always make sure to remove the pen cap before installation.

Simple replacement

1. Open the front door, and make sure that recording is OFF. Power may be ON.

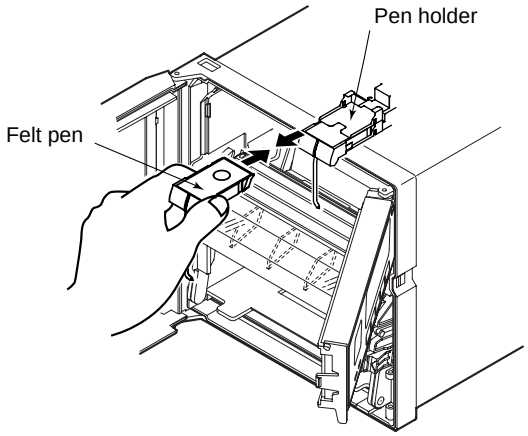


2. Pull and open the display around the hinge.

CAUTION

- Please take care not to apply any undue pressure in an upward or downward direction to the display, to prevent strain on the hinges.
- Do not force the display open any further than about 100° from being closed.

3. Pull out the pen-cartridge by pulling the protruding part of the cartridge from the pen holder.



1st pen : red
2nd pen : green
3rd pen : blue

4. Remove the cap from a new felt-tip pen, and insert the pen firmly to the pen holder.
5. Press the **RCD** key to restart the recording.

Replacement under pen-replacement mode

When a pen is located at a place where its replacement is difficult to do, relocate the pen by the following procedures:

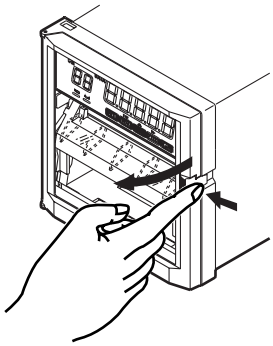
1. Make sure that recording is OFF. The main Power switch must be ON.
2. Press the △ key for three seconds to display **[C_Pen]**, and press the **ENT** key.
3. Press the △ key to display **[Yes]**, and press the **ENT** key. The pens will move near to the center of the scale where the pens can be easily replaced.
   Note that a line is drawn on the chart when the pens move.
4. Replace the pen according to the 'simple replacement' 2, 3, and 4 described above.
5. After pen replacement the indicator shows **[End]**, then press the **ENT** key.
6. To restart recording, press the **RCD** key.

2.6 Installing/Replacing the Ribbon Cassette (Dot Model)

CAUTION

- Improper cassette insertion may cause faulty print color or damage the cassette.

1. Open the front door, and make sure that power is switched OFF.

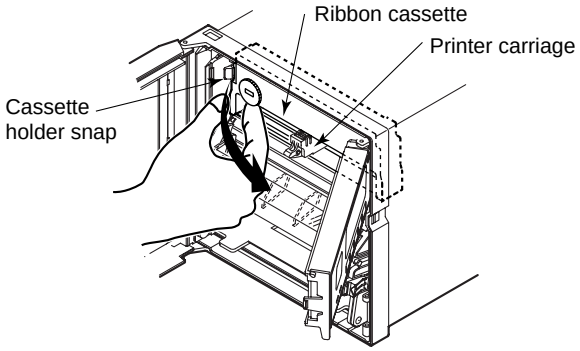


2. Open the display by pulling its left end.

CAUTION

- Please take care not to apply any undue pressure in an upward or downward direction to the display, to prevent strain on the hinges.
- Do not force the display open any further than about 100° from being closed.

3. Hold the printer carriage, and move it to the right.
4. Hold the left-hand part of the ribbon cassette, and pull it out from the recorder case while releasing the cassette holder snap.



5. Insert a new ribbon cassette into the cassette holder; first, insert the right-hand part, next the left-hand part. Check that the cassette is properly engaged with the cassette holder snap.
   If the cassette is not engaged with the holder properly, turn the ribbon feeding knob in the direction of the arrow to fit the peg to the driving hole of the holder.
6. To check that the cassette is properly inserted, turn the left-hand knob in the direction of the arrow a half or more turning.
7. If the ribbon loosens, turn the knob in the direction of the arrow to tighten it.
8. Turn the display back to the normal position.

3.1 Periodic Inspection

Check the following items periodically, and replace parts, if necessary:

Character printing

Are recorded lines or printed characters clear, not blurred?

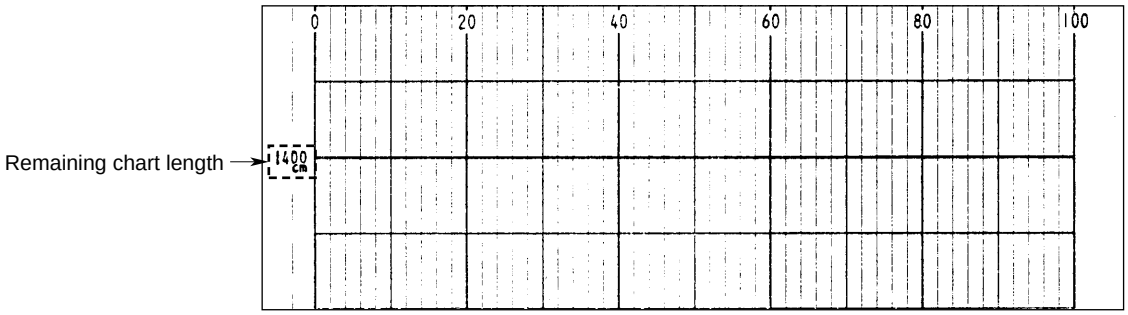
To replace a felt-tip pen, refer to the *User's Manua*l Section 2.5 *Installing/Replacing Pens*; also, refer to *User's Manual* Section 2.6 *Installing/Replacing Ribbon Cassette* to replace the ribbon cassette of a dot-printing model.

Chart paper

Is there enough chart paper left in the chart compartment ?

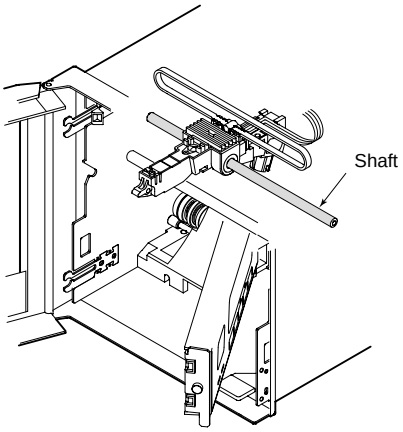
Remaining chart length (cm) is printed on the left margin of the chart at intervals of 20 cm. See also *User's Manual* Section 2.4 *Loading Chart Paper*.

Indication of Remaining Chart Length:



Cleaning the Carriage Shafts (Dot Model)

To maintain proper recording functions, it is recommended to, if necessary, wipe up dust from the shaft of the printer carriage with a piece of soft cloth or paper without fluffing.



3.2 Fuse

WARNING

- Don't replace the fuse by yourself. Never take the recorder apart to replace a fuse.

Please contact your nearest Yokogawa sales representative if the fuse needs to be replaced.

Fuse Ratings

Rated Voltage	:	250 V
Rated Current	:	1.25 A
Type	:	Time lag
Approved Standard	:	IEC/VDE

4.1 Error Messages

Error Code List

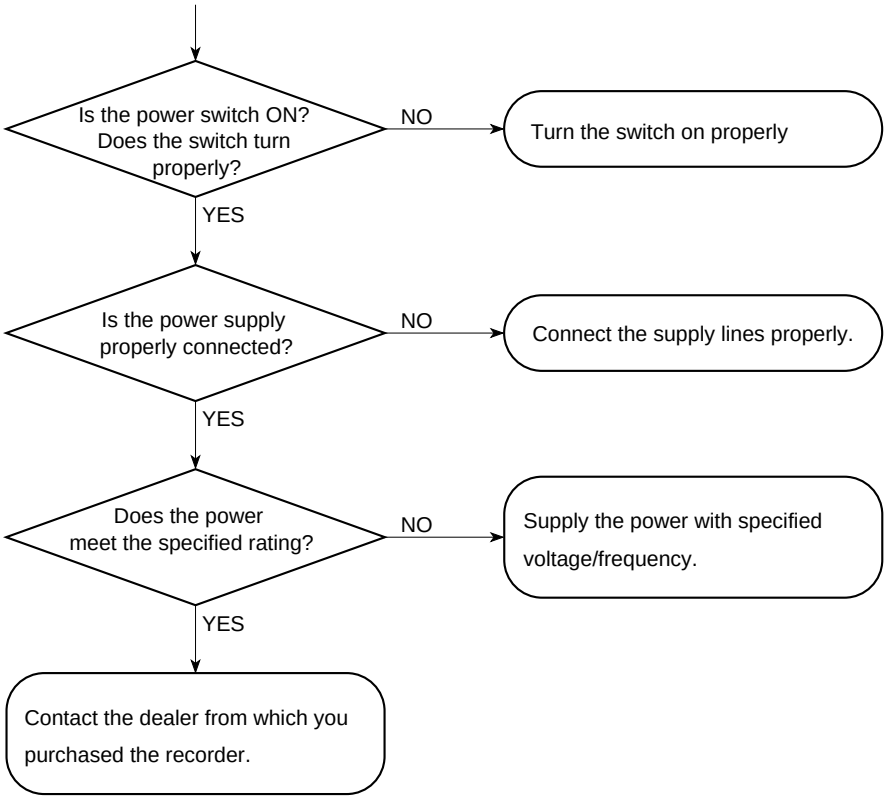
Please contact the dealer from which you purchased this recorder in case the following errors appear. See the *Technical Manual*, Section 6, for more error messages.

Error Codes	Meaning	Recovery
Er M_dt1	Main memory reading error.	Contact the dealer from which you purchased the recorder.
Er M_dt2	Main memory writing error.	
Er A_dt1	A/D converter memory reading error.	
Er A_dt2	A/D converter memory writing error.	
Er AdAdJ	Calibration data error of A/D converter.	
Er roM	System ROM failure.	
Er rAM	System RAM failure.	
Er rbn	Ribbon shift, ribbon feed failure (dot model).	
Er Prn	Printer failure (dot model).	
Wr S_dt□	Range memory reading/writing error.	
	Er001	System failure.
	Er012	Attempt to replace pen (C_PEn) while recording.	Stop recording.

4.2 Troubleshooting

See the *Technical Manual*, Section 6, for more troubleshooting information.

Recorder is completely inoperative:


Is the power switch ON? Does the switch turn properly?
NO
Turn the switch on properly
YES
Is the power supply properly connected?
NO
Connect the supply lines properly.
YES
Does the power meet the specified rating?
NO
Supply the power with specified voltage/frequency.
YES
Contact the dealer from which you purchased the recorder.

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